

## Trematodes of the mongoose *Herpestes edwardsii edwardsii* Geoffroy from Visakhapatnam District

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**Abstract.** An examination of twelve specimens of mongoose from Visakhapatnam District yielded fourteen cysts with two *Paragonimus compactus* in each cyst from two hosts, and several specimens of a new species of *Euparadistomum* (family: Dicrocoeliidae). *E. herpestesi* n.sp., differs from the hitherto known species in the ratio of testes to ventral sucker and the shape of ovary. There is a characteristic dorsal chamber of the receptaculum seminis which can be seen very clearly in whole mounts also.

**Keywords.** Digenetic trematodes; Indian mongoose, *Herpestes edwardsii edwardsii*; *Paragonimus compactus*; *Euparadistomum*.

### 1. Introduction

In our studies on helminths of mammals of Andhra Pradesh opportunities were provided to work with material from wild life. In this paper we deal with trematodes of the Indian mongoose *Herpestes edwardsii edwardsii* Geoffroy of Visakhapatnam District. Its occurrence is widespread in India and abundant in Visakhapatnam. Little is known of the parasites of Indian mongoose. Two trematodes are of frequent occurrence. In the gall bladder, the dicrocoeliid genus *Euparadistomum* is fairly common, and in the lungs the genus *Paragonimus* has also been encountered. The latter may be of considerable zoonotic significance.

### 2. Materials and methods

Twelve specimens of mongoose were examined. Of these two were infected with *Paragonimus*. From one mongoose 12 cysts were collected. From the other, two cysts were collected. *Euparadistomum* is fairly common. Seven mongooses were found infected with *Euparadistomum*. From each mongoose, 1-3 flukes could be obtained.

Some flukes were flattened in FAA and some in 70% alcohol for whole mounts. Flukes fixed in FAA were stained with alum carmine and flukes fixed in 70% alcohol were treated with catechol or fast red salt B and mounted in canada balsam.

### 3. Observations

#### 3.1. *Paragonimus* (figure 1)

The flukes are reddish brown in colour and oval in shape when freshly collected. The size varies from  $9-11 \times 4.3-5$  mm. The oral sucker is  $0.34-0.57$  mm  $\times$   $0.4-0.56$  mm. Mouth leads into pharynx which immediately bifurcates into two caeca which have an undulating appearance and terminate blindly in the posterior region. The acetabulum is  $0.56-0.7 \times 0.65-0.7$  mm. The tegument is studded with groups of 2-7 sharp spines.

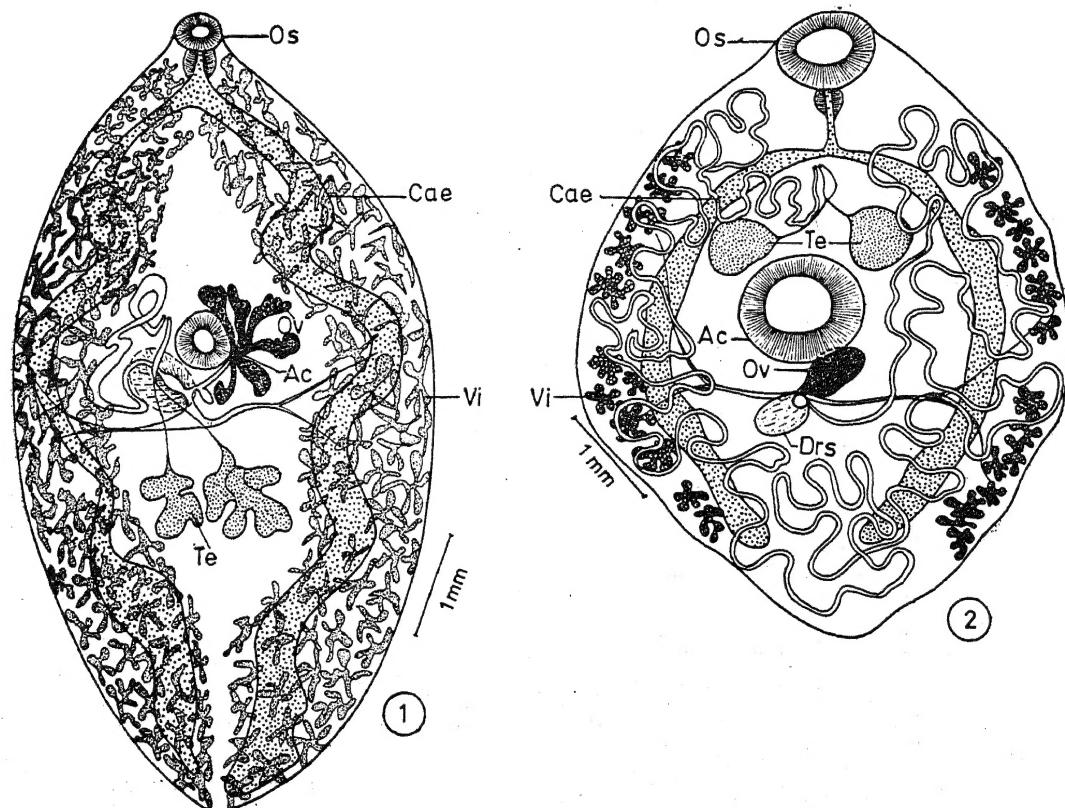
The two testes are post-acetabular, intercaecal and lobed. Cirrus sac is absent. Genital pore opens just near the ventral sucker.

Ovary is situated on one side of the acetabulum and consists of six lobes. Vitellaria are follicular, dense on lateral sides. Receptaculum seminis is small and pear-shaped. Mehlis' gland is large and conspicuous in whole mounts also. Laurer's canal can be seen in sections opening outside.

The eggs are brown in colour, operculated and measure  $70 \mu$  by  $42-56 \mu$ . The shell is of uniform thickness throughout.

#### 3.2. *Euparadistomum* (figure 2)

The flukes are oval and flattened. They measure  $6.5-9.8 \times 4.5-7$  mm. The oral sucker measures  $0.5-1 \times 0.5-1$  mm. Mouth leads into a short pharynx



Figures 1-2. 1. *Paragonimus compactus*. 2. *Euparadistomum herpestesi*. (Ac—acetabulum; Cae—caeca; Drs—dorsal chamber of receptaculum seminis; Os—oral sucker; Ov—ovary; Te—testes; Vi—vitellaria).

measuring  $0.18-0.32 \times 0.22-0.35$  mm and immediately leads into a narrow oesophagus measuring  $0.44-0.65 \times 0.04-0.07$  mm which opens into two broad caeca. Caeca extend a little short of the posterior extremity and terminate blindly. Prepharynx is absent. The acetabulum is nearly in the middle of the body and measures  $1-1.7 \times 1.1-1.8$  mm.

The testes are symmetrical and placed anterior to the acetabulum. They measure  $0.62-0.8 \times 0.57-0.73$  mm. The vasa eferentia are prominent and meet to form the common vas deferens which enters the cirrus sac. The vas deferens dilates in the cirrus sac to form the seminal vesicle which continues as muscular cirrus. Prostate gland is also clear in sections. Cirrus sac opens posterior to the caecal bifurcation into the genital pore. Ovary is elongated measuring  $0.38-0.5 \times 0.7-1$  mm. It lies immediately posterior to the acetabulum but slight overlapping is evident. The oviduct runs posteriorward and is joined by another duct, the spermiduct. The spermiduct opens into a small spherical chamber measuring  $0.128-0.176 \times 0.112-17$  mm which immediately continues dorsally as a big chamber measuring  $0.576-0.8 \times 0.528-0.64$  mm. These two chambers are very clear in sections as well as in whole mounts. The big chamber can be interpreted as a dorsal chamber of receptaculum seminis and the smaller chamber as ventral chamber of receptaculum seminis. Laurer's canal opens dorsally.

Vitellaria extend from the testicular region to caecal ends. They are follicular, extracaecal and interrupted in the middle on either side. From each group of vitellaria a common vitelline duct arises and the two ducts of each side meet to form the transverse vitelline ducts. These two ducts meet to form a small vitelline reservoir which joins the oviduct near the ootype by the median vitelline duct. The ootype is surrounded by Mehlis' gland cells. The uterus continues as a much coiled uterus occupying the whole body behind the oral sucker. Uterus opens by the side of the male genital opening as a metraterm. The eggs measure  $48 \times 28 \mu$ .

#### 4. Discussion

The arrangement of cuticular spines, the shape of ovary, testes, the relative size of oral sucker and the acetabulum and the characters of eggs are useful criteria for differentiating species of *Pargonimus*. *P. compactus* from the Indian mongoose *H. edwardsii edwardsii* has been reported by Cobbold in 1859. Other reports from India are *P. westermani* by Kerbert (1878) and *P. edwardsii* by Gulati in 1926, in other hosts.

Our flukes come nearer to *P. compactus* (Cobbold 1859) in all characters except for the size of the fluke and the number of lobes of ovary. It resembles *P. compactus*, i.e., in the number and arrangement of spines, the shape of ovary and testes, the relative size of oral sucker and acetabulum and the eggs and the host also.

Our flukes are much bigger (9-11 mm) in size than *P. compactus* which is 4-5 mm. Vevers (1923) redescribed *P. compactus* in detail, and according to that the ovary of *P. compactus* has four or five lobes, but in our specimens the ovary is six lobed. Miyazaki (1962) also confirmed the five lobed condition of *P. compactus*. Evidently some variation in the number of these lobes is possible.

A key to the species of *Euparadistomum* Tubangui, 1931 has been given by Singh 1958. Later a revised key was furnished by Talbot in 1970. According to this

later key our flukes come near to *E. upupai* (Chatterji, 1952) in having the diameter of testes half that of the ventral sucker, in the genital pore being ventral to caecal bifurcation. But it differs in the shape of the ovary. In the case of *E. upupai* the ovary is lobed whereas in our flukes it is neither lobed nor round but somewhat elongated with entire walls. Moreover, it is slightly overlapped by the acetabulum, whereas in *E. upupai* it is not overlapped by the ventral sucker. It differs from *E. buckleyi* Singh, 1958 in its size, relative sizes of ovary, testes, and acetabulum. In *E. buckleyi* the testes are smaller measuring one-fourth of the acetabulum and the ovary is bigger than testes. In the present flukes the testes measure nearly half of the acetabulum and ovary is elongated and smaller than testes. It differs from all others due to its 1 : 2 ratio of testes to ventral sucker and shape of ovary.

Another distinguishing feature in our fluke is that there is a dorsal chamber of receptaculum seminis very clearly seen in whole mounts also. This has not hitherto been reported in any of the *Euparadistomum* species. The genus *Euparadistomum* has not been reported from mongoose till now. The size of our specimens is also greater than the other species. Thus it has been considered necessary to erect a new species to accommodate the present fluke. We propose the name *Euparadistomum herpestesi* for the present fluke.

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